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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,396	03/12/2004	Young-Joon Rhee	AB-1355 US	7324

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06/29/2005

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EXAMINER

CHIEN, LUCY P

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/799,396

Applicant(s)

RHEE ET AL.

Examiner

Lucy P. Chien

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

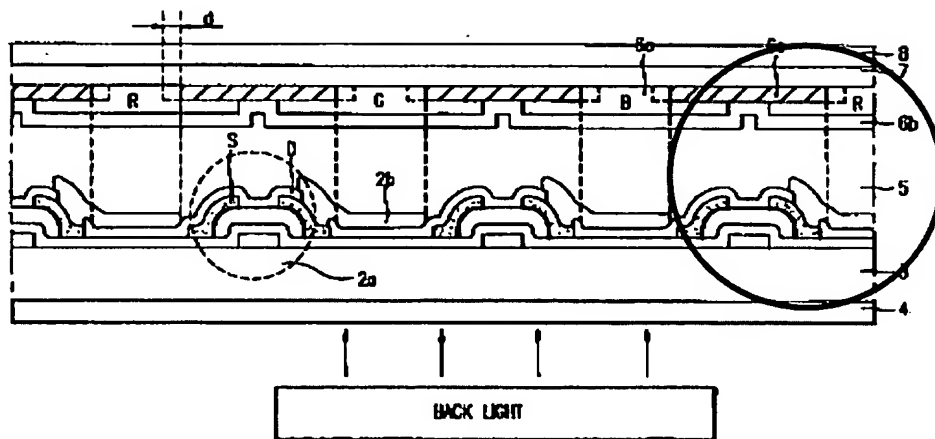
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) in view of Lyu (US 5754261)

Kadota et al teaches in Figure 1 a plurality of thin film transistors (TFT, 3) formed on the substrate (20). A plurality of three primary color filters (8,9,10) formed on the substrate (20). A plurality of first pixel electrodes (1) formed on the color filters (8,9,10) and connected to the thin film transistors (TFT, 3) to complete a liquid crystal display with color filters.

Kadota does not disclose the second pixel electrode on the substrate.

Lyu in Figure 2 discloses the (circled in drawing below) second pixel electrode (2b) formed on the substrate (3) connected to the thin film transistor (2a) and the second pixel electrode do not overlap the other color filters (R,G,B). The second pixel is located on the same layer as all the other color filters. The second pixel electrode is included to add another color filter or white filter.



It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to add another second pixel electrode that doesn't overlap another color filter to be able to add on another filter to brighten the display or add more color effects to the display.

Claim 2,3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) in view of Takizawa et al (US 6785068)

Regarding *Claim 2*,

Kadota et al discloses in Figure 1 an organic insulating layer (11) (Column 4, Rows 52-60) used to contact the pixel electrode including a plurality of first portions disposed between the color filters (8,9,10) and the first pixel electrodes (1).

Kadota et al and Lyu do not disclose that the second portion has a larger thickness than the first portion.

Takizawa et al discloses (Column 3, row 58-63) the color (red, green, blue) portion (first portion) is thicker than the light (white) color portion (second portion) to maintain a smooth surface (Column 5, Rows 35-40).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Takizawa's color thickness to provide a uniform surface. (Column 5, Rows 35-40).

Regarding *Claim 3*, Kadota et al and Lyu as described above in addition to Kadota et al teaches in Figure 1 an inorganic insulating layer (5) disposed between the color filters (8,9,10) and the thin film transistors (TFT, 3)

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) in view of Morozumi (Re 33882).

Kadota et al and Lyu do not disclose the use of a transparent filter.

Morozumi discloses (column 10, row 48-60) the use of a white filter (transparent filter) under a electrode (Figure 9a, (96)) used to brighten the display.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Morozumi's white filter to improve the overall brightness of the display. (Column 10, Rows 54-60)

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Claim 5,6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) and of Morozumi (Re 33882) in view of Kawase (US 6787275).

Regarding *Claim 5*,

Kadota et al, Lyu, and Morozumi do not disclose the transparent filter being made of a transparent photosensitive material or acrylic material.

Kawase discloses (Column 23,Row 18-25) the transparent filter made of a transparent photosensitive material for excellent light transmittance.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Morozumi's white filter to include Kawase's transparent photosensitive material to display excellent transmittance of visible light. (Column 23,Row 18-25).

Regarding *Claim 6*,

Kadota et al, Lyu, and Morozumi as described above in addition Kadota et al teaches in Figure 1 an inorganic insulating layer (5) disposed between the color filters (8,9,10) and the thin film transistor (TFT, 3).

Claim 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) in view of Sunohara et al (US 5587819).

Regarding *Claim 7 and 8*,

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Kadota et al and Lyu do not disclose the first pixel electrode including third, fourth, and fifth pixel electrodes located under the red, green, and blue color filters.

Sunohara et al discloses in Fig. 28 the three major colors being red, blue, and green. The three colors located on top and three pixel electrodes located under it and the pixel electrodes are also arranged in a direction so the display can produce high-luminance colors (in Abstract).

Regarding *claim 9*,

Kadota et al and Lyu do not disclose the first and second pixel electrodes arranged in a 2x3 matrix where all the pixels are arranged in sequence.

Sunohara et al also discloses in Figure 28 a 2x3 matrix having a first row including third (first pixel) fifth (second pixel) and fourth pixel (third pixel) electrodes arranged in sequence and a second row including fourth (fourth pixel), second (fifth pixel) and third pixel (sixth pixel) electrode arranged in sequence to provide high luminance colors (Column 34, Rows 41-55).

Regarding *Claim 10*,

Kadota et al and Lyu do not disclose a 2x2 matrix having the pixel electrodes arranged in sequence as claimed.

Sunohara discloses in Figure 3, a 2x2 matrix having the first row including third (first pixel) and fourth pixel electrodes (third pixel) arranged in sequence and a second row including fifth (fifth pixel) and second pixel electrodes (second pixel) arranged in sequence to provide high luminance colors.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device with Lyu's color display device with second pixel electrodes to include Sunohara et al's primary colors in the arranged order to provide high luminance colors (Column 34, Rows 41-55).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) in view of Park et al (US20020074549).

Regarding *Claim 11*,

Kadota et al discloses in Figure 1 a first substrate (20) A plurality of gate lines (3) formed on the first substrate (20). A gate insulating layer (4) formed on the gate lines (3); a semiconductor layer (2) formed on the gate insulating layer (4); a plurality of data lines (not shown, known existence) formed on the gate insulating layer (4) and intersecting the gate lines (3) to define a plurality of pixel areas; a first protective layer (5) formed on the data lines (not shown, known existence); a plurality of red (8), green (9), blue (10) color filters formed on the first protective layer (5). A second protective layer (11) formed on the color filters (8,9,10). A plurality of pixel electrodes (1) formed on the second protective layer (11) and electrically connected (CON) to the gate lines (3) and data lines through the semiconductor layer (2). A second substrate (12) facing the first substrate (20). A common electrode (13) formed on the first substrate and a liquid crystal layer (shown between 13 and 1) interposed between the first substrate (20) and second substrate (20).

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Kadota et al does not disclose an Ohmic contact layer nor does Kadota et al disclose the liquid crystal layer interposed between the first substrate and second substrate wherein the pixel areas include a plurality of white pixel areas having no color filter.

Park et al (Page 5 Row [0097]) teaches the use of an Ohmic contact layer used to reduce contact resistance to provide better contact between semiconductors.

Morozumi discloses (column 10, row 48-60) that the use of white (transparent) filters (pixels) are used so that the overall brightness of the display can be improved.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter and also to include Park et al's ohmic contact layer to provide excellent contact between semiconductors and to display excellent transmittance of visible light with white filters.

Regarding *Claim 20*, Kadota et al, Morozumi and Park et al as described above in addition Kadota et al teaches (Column 4, Row 30-37) a black mask used as a light shielding layer.

Claim 12,17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) in view of Yamada (US 6798471).

Kadota et al, Morozumi and Park et al do not disclose the use of a vertical aligned liquid crystal.

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Yamada discloses (Column 1, Rows 19-26) that the use of a vertically aligned liquid crystal provides higher contrast, higher response speed, and excellent viewing angle characteristics.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter and Park et al's ohmic contact layer to include Yamada's vertically aligned liquid crystal to provide excellent viewing angles for the display.

Claim 13,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) and of Yamada (US 6798471) in view of Kim et al (US 20020145695).

Kadota et al, Morozumi, Park et al and Yamada do not disclose the use of protrusions formed on the common electrode and made of organic material, wherein the pixel electrodes have cutouts.

Kim et al discloses in FIG. 1E (page 3, [0044]) the common electrode 400, and the protrusion 412 is formed on the common electrode 400. The protrusion 412 is made of organic material used to form contacts between semiconductors. Fig. 3a shows arrangements of the same invention of the pixel electrode (90) cutouts corresponding to the common electrode (400). Which stabilize the electric field (Page 4, [0062]).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter

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and Park et al's Ohmic contact layer and Yamada's vertically aligned liquid crystal to include Kim et al's protrusions for better stabilization of the electric field (Page 4, [0062]).

Claim 14,19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) in view of Kawase (US 6787275).

Regarding *Claims 14 and 19*,

Kadota et al, Morozumi, and Park et al do not disclose the liquid crystal layer having a twisted alignment.

Kawase discloses in Figure 40 (Column 26, Rows 54-60) having a twisted nematic liquid crystal serves as a transmission of light liquid crystal.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter to include Kawase's twisted nematic liquid crystal to control the transmission of light. (Column 26, Rows 54-60)

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) in view of Takizawa et al (US 6785068).

Kadota et al, Morozumi and Park et al do not disclose the white pixel area thicker than the first portion.

Takizawa et al discloses (Column 3, row 58-63) the color (red, green, blue) portion (first portion) is thicker than the light (white) color portion (second portion) to maintain a smooth surface (Column 5, Rows 35-40).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's white filter and also to include Park et al's ohmic contact layer to include Takizawa's color thickness to provide a uniform surface. (Column 5, Rows 35-40).

Claim 16,20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Lyu (US 5754261) and of Morozumi (Re 33882) in view of Park et al (US20020074549)

Kadota et al and Lyu do not disclose a transparent filter and an Ohmic contact layer.

Park et al (Page 5 Row [0097]) teaches the use of an Ohmic contact layer used to reduce contact resistance to provide better contact between semiconductors.

Morozumi discloses (column 10, row 48-60) that the use of white (transparent) filters (pixels) are used so that the overall brightness of the display can be improved.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device and Lyu's color display device with second pixel electrodes on the same layer as the other color filters to include Morozumi's white filter and also to include Park et al's ohmic contact layer to provide excellent contact between semiconductors and to display excellent transmittance of visible light with white filters.

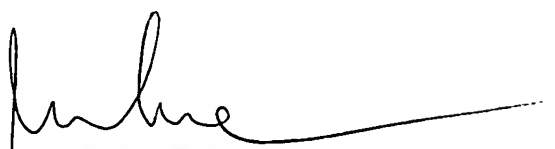
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy P. Chien whose telephone number is 571-272-8579. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lucy Chien
Examiner
Art Unit 2871
LC


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PRIMARY EXAMINER